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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/748,920	12/29/2003	Lowell Scott Smith	RD-29,129	8403
41838	7590	09/15/2005	EXAMINER	
GENERAL ELECTRIC COMPANY (PCPI) C/O FLETCHER YODER P. O. BOX 692289 HOUSTON, TX 77269-2289			TAMAI, KARL I	
			ART UNIT	PAPER NUMBER
			2834	

DATE MAILED: 09/15/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/748,920

Applicant(s)

SMITH ET AL.

Examiner

Tamai I.E. Karl

Art Unit

2834

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 04 August 2005.  
2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.  
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-12 and 30-33 is/are pending in the application.  
4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.  
5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.  
6) ☒ Claim(s) 1-3, 8, 11, 12 and 30-33 is/are rejected.  
7) ☒ Claim(s) 4-7, 9 and 10 is/are objected to.  
8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☒ The specification is objected to by the Examiner.  
10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).  
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some \* c) ☐ None of:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)  
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)  
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 5/21/04, 5/11/04  
4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_  
5) ☐ Notice of Informal Patent Application (PTO-152)  
6) ☐ Other: \_\_\_\_\_

## **DETAILED ACTION**

### ***Election/Restrictions***

1. Applicant's election without traverse of Group I, Claim 1-12 and 30-33 in the reply filed on 8/4/2005 is acknowledged.

### ***Specification***

2. The specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.
3. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

### ***Claim Rejections - 35 USC § 102***

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Art Unit: 2834

5. Claims 1-3, 8, 12, 30, and 31 are rejected under 35 U.S.C. 102(b) as being clearly anticipated by Fraser (US 6443901). Fraser teaches a CMUT cell having a membrane 68 supported by compliant support 60 which change shape during expansion/contraction of the membrane. The compliant support having the shape of a cantilever and moving in a piston like manner. Fraser teaches the first electrode 70 on the membrane and an electrode 52 on the substrate, where the electrode 52 is positioned on a pedestal 28.

6. Claims 1-3, 12, and 30 are rejected under 35 U.S.C. 102(e) as being clearly anticipated by Whitehead (US 5450498). Whitehead teaches a cMUT cell having a membrane 67 with an electrode 60 supported by resilient/compliant spacers 66. Whitehead teaches the electrode 65 can be formed on pedestals.

7. Claims 1, 2, and 12 are rejected under 35 U.S.C. 102(b) as being clearly anticipated by Swart et al. (Swart) (US 6025951). Swart teaches a mechanical actuator having a compliant support 40 shape and size during movement and a mirror membrane 42. Swart teaches the membrane 104 and the metal electrode 94 with a cavity therebetween formed by the compliant support, where the compliant support allows a piston like movement (figure 6c).

8. Claims 1, 2, 8, 11, and 12 are rejected under 35 U.S.C. 102(b) as being clearly anticipated by Horning et al. (Horning)(US 2002/0125790). Horning teaches a mechanical actuator having a substrate 89 with a membrane 104 and electrodes 105, with compliant supports 82, 84 which are secured in a cantilevered fashion and that changes shape and size during movement.

***Claim Rejections - 35 USC § 103***

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

10. Claims 8 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Swart et al. (Swart) (US 6025951) in further view of Wendland, Jr. (US 6785039). Swart teaches every aspect of the invention except the compliant structure resembles a cantilevered beam or a double cantilevered. Wendland teaches a double cantilevered beam for supporting the membrane 114. It would have been obvious to a person of ordinary skill in the art at the time of the invention to construct the actuator of Swart with cantilevered beam of Wendland to provide improved support to help prevent stiction.

11. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Swart et al. (Swart) (US 6025951) in further view of Brophy et al. (Brophy)(US 6735008). Swart teaches every aspect of the invention except the electrodes supported by a pedestal. Brophy teaches the electrodes supported by an insulating pedestal 42. It would have been obvious to a person of ordinary skill in the art at the time of the invention to construct the actuator of Swart with electrodes formed on pedestals to help insulate the electrodes from the substrate.

12. Claims 8, 11, and 31 is rejected under 35 U.S.C. 103(a) as being unpatentable over Whitehead (US 5450498) in further view of Greenberg et al. (Greenberg)(US 6836029). Whitehead teaches every aspect of the invention except the shape of the compliant support being a cantilever. Greenberg teaches equivalent springs in the electrostatic actuators including a cantilever and a compressible coating. Greenberg teaches a triple cantilever beam support. It would have been obvious to a person of ordinary skill in the art at the time of the invention to construct the capacitive acoustic transducer of Whitehead with the cantilever spring of Greenberg to provides resilient support to the deflected membrane, and because it is within the ordinary skill in the art to choose between know equivalents.

13. Claim 32 is rejected under 35 U.S.C. 103(a) as being unpatentable over Whitehead (US 5450498) in further view of Hill et al. (Hill)(US 5600610). Whitehead teaches every aspect of the invention except the shape of the compliant support being an arch. Hill teaches the resilient support 22 including a arched shape. It would have been obvious to a person of ordinary skill in the art at the time of the invention to construct the capacitive acoustic transducer of Whitehead with the arched resilient support of Hill to provide spacing between the capacitive electrodes as taught by Hill.

Art Unit: 2834

14. Claim 33 is rejected under 35 U.S.C. 103(a) as being unpatentable over Whitehead (US 5450498) in further view of Eaton et al. (Eaton)(GB 2076970). Whitehead teaches every aspect of the invention except the shape of the compliant support being a coil. Eaton teaches electrostatic transducers are supported by coil springs. It would have been obvious to a person of ordinary skill in the art at the time of the invention to construct the capacitive acoustic transducer of Whitehead with the compliant support being a coil because Eaton teaches that a coil springs provides resilient support between the electrodes of a capacitive transducer.

***Allowable Subject Matter***

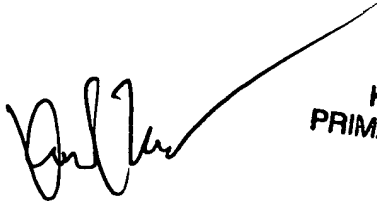
15. Claims 4-7 and 9, 10 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

16. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Karl I.E. Tamai whose telephone number is (571) 272 - 2036.

The examiner can be normally contacted on Monday through Friday from 8:00 am to 4:00 pm. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mr. Darren Schuberg, can be reached at (571) 272 - 2044. The facsimile number for the Group is (571) 273 - 8300.

Art Unit: 2834

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



KARL TAMAI  
PRIMARY EXAMINER

Karl I Tamai  
PRIMARY PATENT EXAMINER  
September 6, 2005